

SEQUENCE LISTING

<110> CHONNAM NATIONAL UNIVERSITY et al.

<120> MUCOSAL VACCINE ADJUVANTS CONTAINING BACTERIAL FLAGELLINS AS AN ACTIVE COMPONENT

<130> Q95704

<150> KR 10-2004-0001974

<151> 2004-01-12

<160> 18

<170> KopatentIn 1.71

<210> 1

<211> 1131

<212> DNA

<213> Vibrio vulnificus

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gcgaaagatg atgctgcagg tctacaaatt tctaaccgtt tgaactcgca aagccgtggt	180
ctcgacatgg cggttaaaaa tgccaacgat ggtatctcta ttgcacagac tgctgaaggt	240
gcaatgacag agaccaccaa catcctacaa cgtatgcgtg accttgcctt gcaatcgtct	300
aacggttcga actctcgttc tgaacgcgtg gcgattcaag aagaagtgtc agcgttgaac	360
caagaactta accgtatcgc agagacaacc tcttttggtg gtaacaaact ccttaacggt	420
acgtacggtt ctcaatcttt ccaaactcgtt gctgactctg gtgaagctgt gatgctttct	480
atgggtaacc ttcgttcaga tacagacgcg atgggaggct tgagctacaa atctgaagaa	540
ggcgtaggcg cagattggcg tgtaagcgac aacactgact tcacgatgtc ttatgtgaat	600
aagcaagggtg aagaaaaaga gatcacagtc aacgccaaag cgggtgacga tcttgaagaa	660
ctggcgactt acatcaacgg tcaaaacgat gatgtgaaag cgtcggtcgg tgaaggcggc	720
aaactgcagc tattcgcttc taaccaacgt gtagaagggt aagtggaatt cggtggtggt	780
ctagcgtctg agttgaacat tggatgagc accaaaaacca atgtgagcaa cattgatgtc	840
acgacgggtg ctggctctca agaagcagta gcgatcattg atggcgcat gaaatcggt	900
gacagtgagc gtgcctctct aggtgcattc caaaaccggt tcaaccatgc aatcagcaac	960
ctaagcaaca tcaatgagaa cgtaaacgct tcgagcagcc gtatcaagga taccgactac	1020
gcgaaagaaa cgactcagat gactaagacg caaattctgc agcaggcgag tacttctatc	1080
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 <211> 376  
 <212> PRT  
 <213> *Vibrio vulnificus*

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 20 25 30  
 Ser Ser Gly Tyr Lys Ile Asn Ser Ala Lys Asp Asp Ala Ala Gly Leu  
 35 40 45  
 Gln Ile Ser Asn Arg Leu Asn Ser Gln Ser Arg Gly Leu Asp Met Ala  
 50 55 60  
 Val Lys Asn Ala Asn Asp Gly Ile Ser Ile Ala Gln Thr Ala Glu Gly  
 65 70 75 80  
 Ala Met Thr Glu Thr Thr Asn Ile Leu Gln Arg Met Arg Asp Leu Ala  
 85 90 95  
 Leu Gln Ser Ser Asn Gly Ser Asn Ser Arg Ser Glu Arg Val Ala Ile  
 100 105 110  
 Gln Glu Glu Val Ser Ala Leu Asn Gln Glu Leu Asn Arg Ile Ala Glu  
 115 120 125  
 Thr Thr Ser Phe Gly Gly Asn Lys Leu Leu Asn Gly Thr Tyr Gly Ser  
 130 135 140  
 Gln Ser Phe Gln Ile Gly Ala Asp Ser Gly Glu Ala Val Met Leu Ser  
 145 150 155 160  
 Met Gly Asn Leu Arg Ser Asp Thr Asp Ala Met Gly Gly Leu Ser Tyr  
 165 170 175  
 Lys Ser Glu Glu Gly Val Gly Ala Asp Trp Arg Val Ser Asp Asn Thr  
 180 185 190  
 Asp Phe Thr Met Ser Tyr Val Asn Lys Gln Gly Glu Glu Lys Glu Ile  
 195 200 205  
 Thr Val Asn Ala Lys Ala Gly Asp Asp Leu Glu Glu Leu Ala Thr Tyr  
 210 215 220  
 Ile Asn Gly Gln Asn Asp Asp Val Lys Ala Ser Val Gly Glu Gly Gly  
 225 230 235 240  
 Lys Leu Gln Leu Phe Ala Ser Asn Gln Arg Val Glu Gly Glu Val Glu  
 245 250 255  
 Phe Gly Gly Gly Leu Ala Ser Glu Leu Asn Ile Gly Asp Gly Thr Lys  
 260 265 270  
 Thr Asn Val Ser Asn Ile Asp Val Thr Thr Val Ala Gly Ser Gln Glu  
 275 280 285

Ala Val Ala Ile Ile Asp Gly Ala Leu Lys Ser Val Asp Ser Glu Arg  
 290 295 300

Ala Ser Leu Gly Ala Phe Gln Asn Arg Phe Asn His Ala Ile Ser Asn  
 305 310 315 320

Leu Ser Asn Ile Asn Glu Asn Val Asn Ala Ser Ser Ser Arg Ile Lys  
 325 330 335

Asp Thr Asp Tyr Ala Lys Glu Thr Thr Gln Met Thr Lys Thr Gln Ile  
 340 345 350

Leu Gln Gln Ala Ser Thr Ser Ile Leu Ala Gln Ala Lys Gln Ser Pro  
 355 360 365

Ser Ala Ala Leu Ser Leu Leu Gly  
 370 375

<210> 3  
 <211> 1133  
 <212> DNA  
 <213> *Vibrio vulnificus*

<400> 3  
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 gcaaaagatg acgcagccgg tctgcaaатc tctaaccgct tgaacgtaca aagtcgсggт 180  
 ctagacgttg cggtagctaa cgccaacgac ggtatctcaa tcgcacaaac cgcagaaggt 240  
 gcgatgaacg agaccaccaa catcctacaa cgtatgcgtg acctatctct acaatccgсg 300  
 aacggctcaa actcaaaatc agagcgсgtg gcgattcaag aagaagtгac agcattgaat 360  
 gacgagctaa accgtattgc agaaaccacg tcttttggtg gtaacaagct gctaaacggт 420  
 acttacggca cgaaagcaat gcaaattggt gcggataacg gtgaagсggт catgctttca 480  
 ctgaaagaca tgcgctctga caacgtgatg atgggcggсg tgagctacca agctgaagaa 540  
 ggcaaagaca agaactggaa tgtggccgca ggcgacaacg acttgacgat tgcactgaca 600  
 gacagctttg gtaacgagca agagatcgaa atcaacгсga aagсgggtga tgacatcgaa 660  
 gagctagcga cgtacatcaa cggтcaaaact gaccttgtaa aagсgtcagt gggтgaaggс 720  
 ggcaagctac agatctttgc tggtaacaac aaagttcaag gtgaaattgc tttctcaggt 780  
 agcctagctg gtgaacttgg cctaggcgaa ggcaaaaacg tcacggtaga cacgattgac 840  
 gtgacaaccg tacaaggтgс gcaagagтcг gtagcgattg tggatgcggс actgaaatac 900  
 gtagacagcc accgtgcaga gctgggtgca ttccagaacc gtttcaacca tgcaatcagс 960  
 aacttgгaca acatcaacga aaacgtgaac gcгtcgaaga gccgaatcaa agataccgac 1020

ttcgcgaaaag aaacgactca gttgaccaag acacaaattc tatcgcaagc atcaagttcc 1080  
attcttgctgc aagcgaaaaca agcgccaaac tcagcgctaa gtctactagg cta 1133

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<211> 375  
<212> PRT  
<213> *Vibrio vulnificus*

<400> 4  
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1 5 10 15  
Tyr Leu Asn Asn Ala Asn Ser Ala Gln Gln Thr Ser Met Glu Arg Leu  
20 25 30  
Ser Ser Gly Phe Lys Ile Asn Ser Ala Lys Asp Asp Ala Ala Gly Leu  
35 40 45  
Gln Ile Ser Asn Arg Leu Asn Val Gln Ser Arg Gly Leu Asp Val Ala  
50 55 60  
Val Arg Asn Ala Asn Asp Gly Ile Ser Ile Ala Gln Thr Ala Glu Gly  
65 70 75 80  
Ala Met Asn Glu Thr Thr Asn Ile Leu Gln Arg Met Arg Asp Leu Ser  
85 90 95  
Leu Gln Ser Ala Asn Gly Ser Asn Ser Lys Ser Glu Arg Val Ala Ile  
100 105 110  
Gln Glu Glu Val Thr Ala Leu Asn Asp Glu Leu Asn Arg Ile Ala Glu  
115 120 125  
Thr Thr Ser Phe Gly Gly Asn Lys Leu Leu Asn Gly Thr Tyr Gly Thr  
130 135 140  
Lys Ala Met Gln Ile Gly Ala Asp Asn Gly Glu Ala Val Met Leu Ser  
145 150 155 160  
Leu Lys Asp Met Arg Ser Asp Asn Val Met Met Gly Gly Val Ser Tyr  
165 170 175  
Gln Ala Glu Glu Gly Lys Asp Lys Asn Trp Asn Val Ala Ala Gly Asp  
180 185 190  
Asn Asp Leu Thr Ile Ala Leu Thr Asp Ser Phe Gly Asn Glu Gln Glu  
195 200 205  
Ile Glu Ile Asn Ala Lys Ala Gly Asp Asp Ile Glu Glu Leu Ala Thr  
210 215 220  
Tyr Ile Asn Gly Gln Thr Asp Leu Val Lys Ala Ser Val Gly Glu Gly  
225 230 235 240  
Gly Lys Leu Gln Ile Phe Ala Gly Asn Asn Lys Val Gln Gly Glu Ile  
245 250 255  
Ala Phe Ser Gly Ser Leu Ala Gly Glu Leu Gly Leu Gly Glu Gly Lys

260	265	270
Asn Val Thr Val Asp Thr Ile Asp Val Thr Thr Val Gln Gly Ala Gln		
275	280	285
Glu Ser Val Ala Ile Val Asp Ala Ala Leu Lys Tyr Val Asp Ser His		
290	295	300
Arg Ala Glu Leu Gly Ala Phe Gln Asn Arg Phe Asn His Ala Ile Ser		
305	310	315
Asn Leu Asp Asn Ile Asn Glu Asn Val Asn Ala Ser Lys Ser Arg Ile		
325	330	335
Lys Asp Thr Asp Phe Ala Lys Glu Thr Thr Gln Leu Thr Lys Thr Gln		
340	345	350
Ile Leu Ser Gln Ala Ser Ser Ser Ile Leu Ala Gln Ala Lys Gln Ala		
355	360	365
Pro Asn Ser Ala Leu Ser Leu		
370	375	

<210> 5  
 <211> 1133  
 <212> DNA  
 <213> *Vibrio vulnificus*

<400> 5	
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gcaaaagacg atgcggcagg gctgcaaatt tcgaatcgtc ttcagtcgca aatgcgtggt	180
ttagatatcg cgggtgcgaaa tgccaatgat ggcattctcca ttatgcagac tgcggaagg	240
gcaatgaatg aaaccactaa tattctccaa aggatgcgtg atctttcatt gcaatccgcc	300
aatggttcca atagctatgc tgaaagaata gccttacaag aagaaatgac cgcgttaaat	360
gacgagttga accgtatcgc agaaaccacc tcgttcggtg ggcgtaaatt gctcaatggt	420
tcctttggct cggctgcctt tcagataggg gcagcgtcag gtgaagcggg gcaagtgcaa	480
ctgaagtcga tgcgcagtga tggattgat atgggtggct tcagttacat tgcaaacgga	540
cgtgcccgtt ctgattggca agtaaaagag ggggcgaatg cgcttagcat gtcattcacg	600
aatcgttttg gtgaaacaga aacgatccaa attaatgcga aagccggcga tgatatcgaa	660
gagcttgca cctacattaa tggtcagact gacaaagtca cggcatcggg gaatgaagaa	720
ggtcagctac agttgtttat ggccggcgaa gaaacctcag gaacgttatc gttttcagga	780
gacttagcca gtgaactcgg tttgcaacta aaagggtacg atgcggtgga taatatcgac	840
attacttctg tcggtggcgc tcaacaagca gtggctgtcc ttgataccgc gatgaaatac	900

gtcgatagtc atcgtgctga gctaggggca tatcaaaacc gcttcagcca tgcgattaat 960  
aacctcgaca acatccacga aaacttggcg acatcaaaca gtcgcattca agatacagac 1020  
tatgcgaagg aaaccacgcg catggtcaaa caacagatcc tacagcaagt cagtacttct 1080  
atthtggcgc aggcgaaaaa agggccgaat ctcgcgttga ccttgctggg ata 1133

<210> 6  
<211> 375  
<212> PRT  
<213> *Vibrio vulnificus*

<400> 6  
Val Ala Ile Thr Val Asn Thr Asn Val Ala Ala Leu Val Ala Gln Arg  
1 5 10 15  
His Leu Thr Ser Ala Thr Asp Met Leu Asn Gln Ser Leu Glu Arg Leu  
20 25 30  
Ser Ser Gly Lys Arg Ile Asn Ser Ala Lys Asp Asp Ala Ala Gly Leu  
35 40 45  
Gln Ile Ser Asn Arg Leu Gln Ser Gln Met Arg Gly Leu Asp Ile Ala  
50 55 60  
Val Arg Asn Ala Asn Asp Gly Ile Ser Ile Met Gln Thr Ala Glu Gly  
65 70 75 80  
Ala Met Asn Glu Thr Thr Asn Ile Leu Gln Arg Met Arg Asp Leu Ser  
85 90 95  
Leu Gln Ser Ala Asn Gly Ser Asn Ser Tyr Ala Glu Arg Ile Ala Leu  
100 105 110  
Gln Glu Glu Met Thr Ala Leu Asn Asp Glu Leu Asn Arg Ile Ala Glu  
115 120 125  
Thr Thr Ser Phe Gly Gly Arg Lys Leu Leu Asn Gly Ser Phe Gly Ser  
130 135 140  
Ala Ala Phe Gln Ile Gly Ala Ala Ser Gly Glu Ala Val Gln Val Gln  
145 150 155 160  
Leu Lys Ser Met Arg Ser Asp Gly Ile Asp Met Gly Gly Phe Ser Tyr  
165 170 175  
Ile Ala Asn Gly Arg Ala Arg Ser Asp Trp Gln Val Lys Glu Gly Ala  
180 185 190  
Asn Ala Leu Ser Met Ser Phe Thr Asn Arg Phe Gly Glu Thr Glu Thr  
195 200 205  
Ile Gln Ile Asn Ala Lys Ala Gly Asp Asp Ile Glu Glu Leu Ala Thr  
210 215 220  
Tyr Ile Asn Gly Gln Thr Asp Lys Val Thr Ala Ser Val Asn Glu Glu  
225 230 235 240



gatatctcga tttcgggtag ccttgcctct gaactggggtt tgagtgcga accgattgcg 840  
acaacagtac aagatttggga tctgcgtacc gtacaagggtt ctcagaacgc aattagcggtt 900  
attgacgcgg cattgaagta cgttgattca caacgtgcgg acttaggtgc aaaacagaac 960  
cgtttaagcc acagtattaa taacttggcg aacgttcaag aaaacggtga tgcacgaac 1020  
agccgtatta aagatactga ttttgcgaag gaaacgacgc aaatgacgaa agcacagatt 1080  
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<210> 8  
<211> 383  
<212> PRT  
<213> *Vibrio vulnificus*

<400> 8  
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Tyr Leu Asn Lys Ala Thr Asp Glu Leu Asn Thr Ser Met Glu Arg Leu  
20 25 30  
Ser Ser Gly His Lys Ile Asn Ser Ala Lys Asp Asp Ala Ala Gly Leu  
35 40 45  
Gln Ile Ser Asn Arg Leu Thr Ala Gln Ser Arg Gly Leu Asp Val Ala  
50 55 60  
Met Arg Asn Ala Asn Asp Gly Ile Ser Ile Ala Gln Thr Ala Glu Gly  
65 70 75 80  
Ala Met Asn Glu Ala Thr Ala Val Leu Gln Arg Met Arg Asp Leu Ser  
85 90 95  
Ile Gln Ser Ala Asn Gly Thr Asn Ser Thr Ser Glu Arg Gln Ala Ile  
100 105 110  
His Glu Glu Ala Ser Ala Leu Gln Asp Glu Ile Asn Arg Ile Ala Glu  
115 120 125  
Thr Thr Ser Phe Gly Gly Arg Arg Leu Leu Asn Gly Thr Phe Gly Asp  
130 135 140  
Ala Ala Phe Gln Ile Gly Ser Asn Ser Gly Glu Ala Met Ile Met Gly  
145 150 155 160  
Leu Thr Ser Ile Arg Ala Asp Asp Phe Arg Met Gly Gly Thr Thr Phe  
165 170 175  
Gln Ser Glu Asn Gly Lys Asn Lys Asp Trp Glu Val Ser Ala Asp Asn  
180 185 190  
Ala Glu Leu Asn Ile Val Leu Pro Glu Met Gly Glu Asp Glu Asp Gly  
195 200 205



Asn Val Ile Asp Leu Glu Ile Asn Ile Met Ala Lys Ser Gly Asp Asp  
 210 215 220  
 Ile Glu Glu Leu Ala Thr Tyr Ile Asn Gly Gln Ser Asp Tyr Ile Asn  
 225 230 235 240  
 Ala Ser Val Ser Glu Asp Gly Lys Leu Gln Ile Phe Val Ala Gln Pro  
 245 250 255  
 Asn Val Lys Gly Asp Ile Ser Ile Ser Gly Ser Leu Ala Ser Glu Leu  
 260 265 270  
 Gly Leu Ser Asp Glu Pro Ile Ala Thr Thr Val Gln Asp Leu Asp Leu  
 275 280 285  
 Arg Thr Val Gln Gly Ser Gln Asn Ala Ile Ser Val Ile Asp Ala Ala  
 290 295 300  
 Leu Lys Tyr Val Asp Ser Gln Arg Ala Asp Leu Gly Ala Lys Gln Asn  
 305 310 315 320  
 Arg Leu Ser His Ser Ile Asn Asn Leu Ala Asn Val Gln Glu Asn Val  
 325 330 335  
 Asp Ala Ser Asn Ser Arg Ile Lys Asp Thr Asp Phe Ala Lys Glu Thr  
 340 345 350  
 Thr Gln Met Thr Lys Ala Gln Ile Leu Gln Gln Ala Gly Thr Ser Ile  
 355 360 365  
 Leu Ala Gln Ala Lys Gln Leu Pro Asn Ser Ala Met Ser Leu Leu  
 370 375 380

<210> 9  
 <211> 1134  
 <212> DNA  
 <213> *Vibrio vulnificus*

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 gcaaaagatg acgcagccgg tctgcaaatac tctaaccgct tgaacgtgca aagtcgcggt 180  
 ctagacgttg cggtacgtaa cgccaacgac ggtatctcaa tcgcacaaac cgcagaaggt 240  
 gcgatgaacg agaccaccaa catcctacaa cgtatgcgtg acctatctct gcaatcagcg 300  
 aacggctcaa actcaaaaatc agagcgcgtg gcgattcaag aagagatcac cgcattgaac 360  
 gacgagctaa accgtatcgc agaaaccacg tcttttggtg gtaacaaact gctcaacggc 420  
 acttacggca cgaaagcaat gcaaattggt gcggataacg gtgaagcggc catgctgtca 480  
 ctcaaagaca tgcgctctga caacgtgatg atgggcggcg tgagctacca agctgaagaa 540

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 ggcaagctac agatctttgc tggtaacaac aaagttcaag gtgaaattgc tttctcaggt 780  
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 aacttggaca acatcaacga gaacgtgaac gcgtcgaaga gccgaatcaa agataccgac 1020  
 ttcgcgaaag aaacgactca gttgaccaag acacaaattc tatcgcaagc atcaagttcc 1080  
 attcttgcgc aagcgaaaca agcgccaaac tcagcgctaa gtctactagg ctaa 1134

<210> 10  
 <211> 377  
 <212> PRT  
 <213> *Vibrio vulnificus*

<400> 10  
 Met Ala Val Asn Val Asn Thr Asn Val Ala Ala Met Thr Ala Gln Arg  
 1 5 10 15  
 Tyr Leu Asn Asn Ala Asn Ser Ala Gln Gln Thr Ser Met Glu Arg Leu  
 20 25 30  
 Ser Ser Gly Phe Lys Ile Asn Ser Ala Lys Asp Asp Ala Ala Gly Leu  
 35 40 45  
 Gln Ile Ser Asn Arg Leu Asn Val Gln Ser Arg Gly Leu Asp Val Ala  
 50 55 60  
 Val Arg Asn Ala Asn Asp Gly Ile Ser Ile Ala Gln Thr Ala Glu Gly  
 65 70 75 80  
 Ala Met Asn Glu Thr Thr Asn Ile Leu Gln Arg Met Arg Asp Leu Ser  
 85 90 95  
 Leu Gln Ser Ala Asn Gly Ser Asn Ser Lys Ser Glu Arg Val Ala Ile  
 100 105 110  
 Gln Glu Glu Ile Thr Ala Leu Asn Asp Glu Leu Asn Arg Ile Ala Glu  
 115 120 125  
 Thr Thr Ser Phe Gly Gly Asn Lys Leu Leu Asn Gly Thr Tyr Gly Thr  
 130 135 140  
 Lys Ala Met Gln Ile Gly Ala Asp Asn Gly Glu Ala Val Met Leu Ser  
 145 150 155 160  
 Leu Lys Asp Met Arg Ser Asp Asn Val Met Met Gly Gly Val Ser Tyr  
 165 170 175

Gln Ala Glu Glu Gly Lys Asp Lys Asn Trp Asn Val Ala Ala Gly Asp  
 180 185 190  
 Asn Asp Leu Thr Ile Ala Leu Thr Asp Ser Phe Gly Asn Glu Gln Glu  
 195 200 205  
 Ile Glu Ile Asn Ala Lys Ala Gly Asp Asp Ile Glu Glu Leu Ala Thr  
 210 215 220  
 Tyr Ile Asn Gly Gln Thr Asp Leu Val Lys Ala Ser Val Gly Glu Gly  
 225 230 235 240  
 Gly Lys Leu Gln Ile Phe Ala Gly Asn Asn Lys Val Gln Gly Glu Ile  
 245 250 255  
 Ala Phe Ser Gly Ser Leu Ala Gly Glu Leu Gly Leu Gly Glu Gly Lys  
 260 265 270  
 Asn Val Thr Val Asp Thr Ile Asp Val Thr Thr Val Gln Gly Ala Gln  
 275 280 285  
 Glu Ser Val Ala Ile Val Asp Ala Ala Leu Lys Tyr Val Asp Ser His  
 290 295 300  
 Arg Ala Glu Leu Gly Ala Phe Gln Asn Arg Phe Asn His Ala Ile Ser  
 305 310 315 320  
 Asn Leu Asp Asn Ile Asn Glu Asn Val Asn Ala Ser Lys Ser Arg Ile  
 325 330 335  
 Lys Asp Thr Asp Phe Ala Lys Glu Thr Thr Gln Leu Thr Lys Thr Gln  
 340 345 350  
 Ile Leu Ser Gln Ala Ser Ser Ser Ile Leu Ala Gln Ala Lys Gln Ala  
 355 360 365  
 Pro Asn Ser Ala Leu Ser Leu Leu Gly  
 370 375

<210> 11  
 <211> 1127  
 <212> DNA  
 <213> *Vibrio vulnificus*

<400> 11  
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 agcgatgatg ccgctggaat gcagatagcg aatacgcttc acgtccaaac ccgtgggttg 180  
 gatgtggcat taactaacgc tcatagtgtt tatgctgttg cagaaacagc ggaaggggagc 240  
 ttggaagagg gcagtgaaat actgcagaga ttgcgatctc tttctcttca agccgcaaac 300  
 ggatcgaatt ctgatgagga tcggcgaagt ttgcagttgg aagtgggtgg attgaaagat 360  
 gaagtggaaa gaatagccag gacaaccaca tttgcgggta aaaatctgtt tgatggaagt 420

tatggttcaa aaagttttca tcttggggca aattctaatt ccatttcttt gcaactcaaa	480
aacatgcgga ctcacgttcc tgagatgggc gggatcatt accttgctc ggagccagcg	540
gatgaggatt ggcaagttga caaggaatca aggcaactta gctttacttt tcgagatagc	600
gaaggggatg atcaatccat taagatctcg ctttaagcctg gagacagtct cgaagaagtc	660
gctacgtata tcaattcaca gcaaaatggt gtggagtcct cggtgacgga tgatcggcga	720
ttgcagtttt atgtcgctaa tcgtcacgct cctgatgggt taaatatctc aggaagcttg	780
gagggagagc tagactttga accgcaagga caagtgcgc tcgatgaact cgatatcagt	840
agtgtgggtg gtgctcaatt ggcgattgct gttgttgata ctgcaattca atatctggat	900
tctcaccgaa gtgaaatcgg cagttttcaa aatcgggtag aggggacgat ggacaatttg	960
caaagtatca atcgcaatgt cactgaatca aaagggcgaa tatgggatac cgattttgcg	1020
aaagcatcaa ccgctttagt gaagtctcag gtattgcaac aggctacctc tgccttgctg	1080
gctcaagcca agcaagcccc aggcagtgc attggattgc tatctta	1127

<210> 12  
 <211> 375  
 <212> PRT  
 <213> *Vibrio vulnificus*

<400> 12	
Met Val Ser Leu Asn Thr Asn Val Ser Ala Met Val Ala Gln Arg His	
1 5 10 15	
Leu Ser Thr Ala Ala Ser Gln Val Ala Glu Thr Gln Lys Asn Leu Ser	
20 25 30	
Ser Gly Phe Arg Ile Asn Ser Ala Ser Asp Asp Ala Ala Gly Met Gln	
35 40 45	
Ile Ala Asn Thr Leu His Val Gln Thr Arg Gly Leu Asp Val Ala Leu	
50 55 60	
Thr Asn Ala His Ser Ala Tyr Ala Val Ala Glu Thr Ala Glu Gly Ala	
65 70 75 80	
Leu Glu Glu Gly Ser Glu Ile Leu Gln Arg Leu Arg Ser Leu Ser Leu	
85 90 95	
Gln Ala Ala Asn Gly Ser Asn Ser Asp Glu Asp Arg Gln Ser Leu Gln	
100 105 110	
Leu Glu Val Val Val Leu Lys Asp Glu Val Glu Arg Ile Ala Arg Thr	
115 120 125	
Thr Thr Phe Ala Gly Lys Asn Leu Phe Asp Gly Ser Tyr Gly Ser Lys	
130 135 140	
Ser Phe His Leu Gly Ala Asn Ser Asn Ser Ile Ser Leu Gln Leu Lys	
145 150 155 160	

Asn Met Arg Thr His Val Pro Glu Met Gly Gly Tyr His Tyr Leu Ala  
 165 170 175  
 Ser Glu Pro Ala Asp Glu Asp Trp Gln Val Asp Lys Glu Ser Arg Gln  
 180 185 190  
 Leu Ser Phe Thr Phe Arg Asp Ser Glu Gly Asp Asp Gln Ser Ile Lys  
 195 200 205  
 Ile Ser Leu Lys Pro Gly Asp Ser Leu Glu Glu Val Ala Thr Tyr Ile  
 210 215 220  
 Asn Ser Gln Gln Asn Val Val Glu Ser Ser Val Thr Asp Asp Arg Arg  
 225 230 235 240  
 Leu Gln Phe Tyr Val Ala Asn Arg His Ala Pro Asp Gly Leu Asn Ile  
 245 250 255  
 Ser Gly Ser Leu Glu Gly Glu Leu Asp Phe Glu Pro Gln Gly Gln Val  
 260 265 270  
 Thr Leu Asp Glu Leu Asp Ile Ser Ser Val Gly Gly Ala Gln Leu Ala  
 275 280 285  
 Ile Ala Val Val Asp Thr Ala Ile Gln Tyr Leu Asp Ser His Arg Ser  
 290 295 300  
 Glu Ile Gly Ser Phe Gln Asn Arg Val Glu Gly Thr Met Asp Asn Leu  
 305 310 315 320  
 Gln Ser Ile Asn Arg Asn Val Thr Glu Ser Lys Gly Arg Ile Trp Asp  
 325 330 335  
 Thr Asp Phe Ala Lys Ala Ser Thr Ala Leu Val Lys Ser Gln Val Leu  
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<220>  
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36

<210> 14

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gaagctattg atgaattaat caataacatc tctaacggtc gtgcacttct aggtgctggt	660
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